Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1–77.   (Canceled)

78.   (Currently Amended) A method of making a heterogeneous building block array, the method comprising:

    ~~forming~~ applying building blocks to ~~a plurality of spots on~~ a solid support in a plurality of spots, the spots comprising ~~a plurality of~~ 2, 3, 4, 5, or 6 different building blocks;

    independently coupling ~~a plurality of~~ the different building blocks to the solid support in the spots;

    wherein one or more of the building blocks comprises one or more amino acids.

79.   (Previously presented) The method of claim 78, wherein one or more of the amino acids comprises naturally occurring amino acid or synthetic amino acid.

80.   (Previously presented) The method of claim 78, wherein one or more of the amino acids comprises an amino acid with a functional group on its side chain.
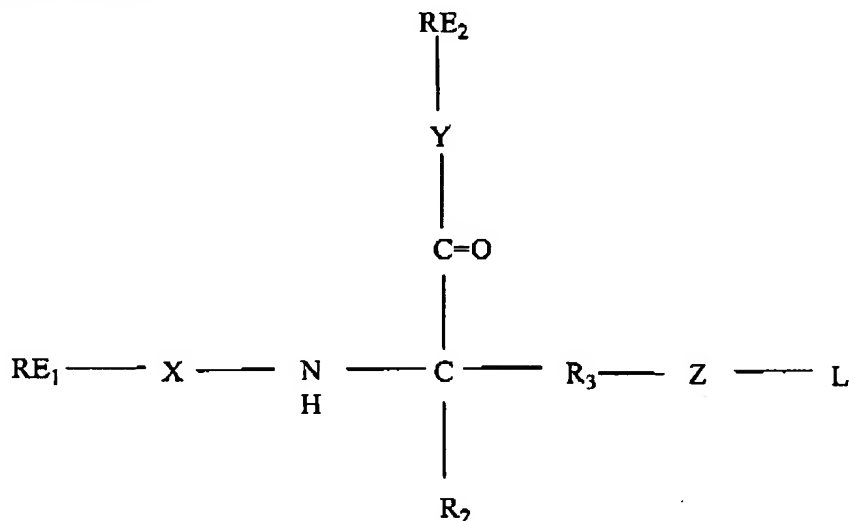
81.   (Previously presented) The method of claim 80, wherein the functional group comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

82.   (Previously presented) The method of claim 78, wherein one or more of the amino acids comprises serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, histidine.

83.   (Previously presented) The method of claim 78, wherein one or more of the amino acids comprises framework and recognition element.

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84.   (Previously presented) The method of claim 78, wherein one or more of the amino acids comprises derivatized amino acid.

85.   (Previously presented) The method of claim 84, wherein one or more of the derivatized amino acids has the formula:

$$
\begin{array}{c}
RE_2 \\
| \\
Y \\
| \\
C{=}O \\
| \\
RE_1 \underline{\quad} X \underline{\quad} \underset{H}{N} \underline{\quad} C \underline{\quad} R_3 \underline{\quad} Z \underline{\quad} L \\
| \\
R_2
\end{array}
$$

in which:

X is absent or C=O;

Y is absent, NH, or O; Z is O;

R_2 is H or CH_3;

R_3 is CH_2 or CH_2-phenyl;

RE_1 is B1, B2, B3, B4, B5, B6, B7, B8, B9, A1, A2, A3, A4, A5, A6, A7, A8, or A9;

RE_2 is A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4, B5, B6, B7, B8, or B9;
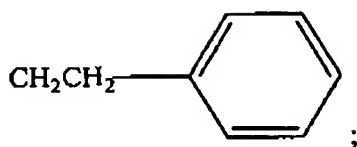
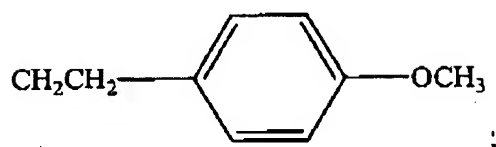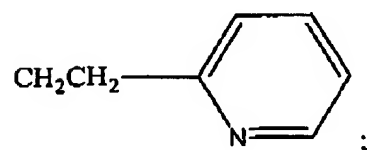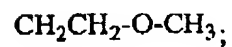L is $(CH_2)_nCOOH$, with n=1-16;

A1 is

$CH_2 CH_3$;

A2 is

$CH_2CH(CH_3)_2$;

A3 is

3

A4 is

A5 is

A6 is

$CH_2CH_2\text{-}O\text{-}CH_3$;

A7 is

$CH_2CH_2\text{-}OH$;

A8 is

$CH_2CH_2\text{-}NH\text{-}C(O)CH_3$;

A9 is

B1 is

CH_3;

B2 is

B3 is

4

B4 is

B5 is

B6 is

CH_2-S-CH_3;

B7 is

$CH_2CH(OH)CH_3$;

B8 is

$CH_2CH_2C(O)-NH_2$; and

B9 is

$CH_2CH_2CH_2-N-(CH_3)_2$.
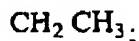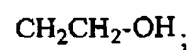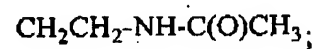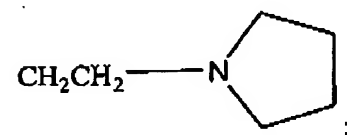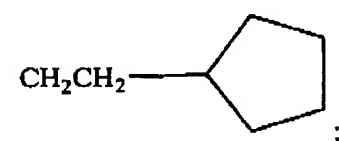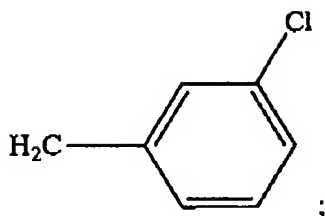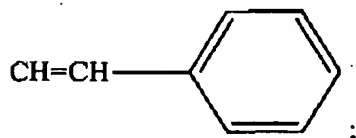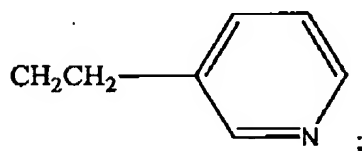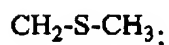
86.   (Previously presented) The method of claim 78, wherein one or more of the building blocks consists of one or more amino acids

87.   (Previously presented) The method of claim 78, wherein one or more of the building blocks has the formula:
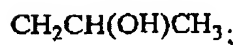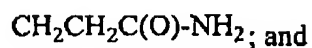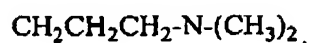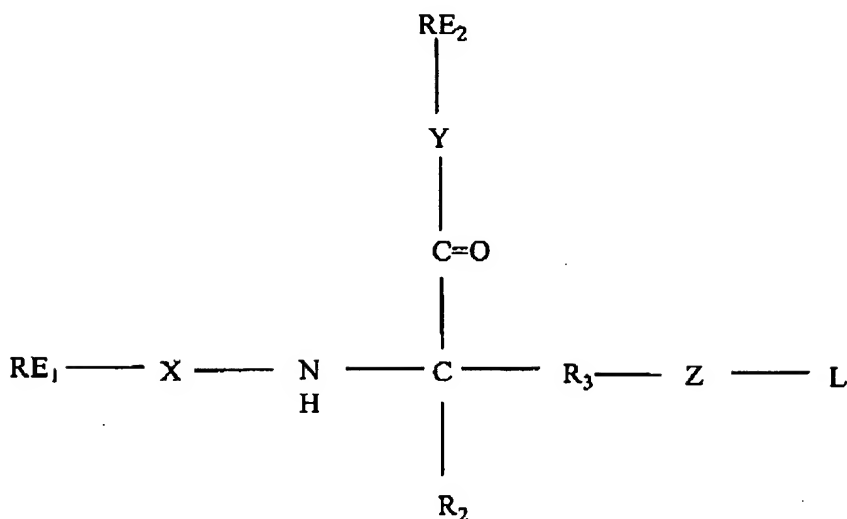
linker-framework-(recognition element).

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88.   (Currently Amended) The method of claim 87, wherein the framework is a naturally occurring amino acid or synthetic amino acid.

89.   (Currently Amended) The method of claim 88, wherein the framework is a naturally occurring amino acid, and the naturally occurring amino acid is serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, histidine.

90.   (Currently Amended) The method of claim 87, wherein the first or second recognition element comprises amino acid side chain functional group.

91.   (Previously presented) The method of claim 90, wherein the functional group comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

92.   (Currently Amended) The method of claim 87, wherein the first or second recognition element comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

93.   (Canceled)

94.   (Currently Amended) A method of making a receptor surface, the method comprising:
       forming applying building blocks to a region on a solid support, the region comprising a plurality of spots, each spot comprising 2, 3, 4, 5, or 6 different building blocks;
       independently coupling the plurality of building blocks to the solid support in the region;
       wherein one or more of the building blocks comprises one or more amino acids.

95.   (Previously presented) A method of making an artificial receptor, the method comprising:
       forming a region on a support, the region comprising a plurality of building blocks;
       coupling the plurality of building blocks to the support in the region;
       wherein one or more of the building blocks comprises one or more amino acids.

96.   (Previously presented) The method of claim 95, wherein the region is a spot.

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97.   (Currently Amended) A method of using an artificial receptor comprising:

contacting a first heterogeneous molecular array with a test ligand;

   the array comprising:

         a support; and

         a plurality of spots of building blocks attached to the support;

               the spots of building blocks comprising a plurality of 2, 3, 4, 5, or
         6 different building blocks; and

               the building blocks being independently coupled to the support;

               one or more of the building blocks comprising one or more amino
   acids;

detecting binding of a test ligand to one or more spots; and

selecting one or more of the binding spots as the artificial receptor;

wherein the building blocks in the array define a first set of building blocks, and the
plurality of building blocks in the one or more binding spots defines one or more selected
binding combination of building blocks.

98.   (Previously presented) The method of claim 97, further comprising:

determining the combinations of building blocks in the one or more binding spots;

developing, based on the combinations determined, one or more developed combinations
of building blocks distinct from those in the one or more selected combinations of building
blocks;

   contacting a second heterogeneous molecular array with the test ligand,

         the second heterogeneous molecular array comprising a plurality of spots,

         the spots comprising a developed combination of building blocks;

               one or more of the building blocks comprising one or more amino acids;

detecting binding of a test ligand to one or more spots of the second heterogeneous
molecular array; and

selecting one or more of the spots of the second heterogeneous molecular array as the
artificial receptor;

wherein the building blocks in the second heterogeneous molecular array define a second
set of building blocks.

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99. (Previously presented) A composition comprising:

a support; and

a portion of the support comprising a plurality of building blocks;

the building blocks being coupled to the support;

one or more of the building blocks comprising one or more amino acids.

100. (Previously presented) The composition of claim 99, wherein one or more of the amino acids comprises naturally occurring amino acid or synthetic amino acid.

101. (Previously presented) The composition of claim 99, wherein one or more of the amino acids comprises an amino acid with a functional group on its side chain.

102. (Previously presented) The composition of claim 101, wherein the functional group comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

103. (Previously presented) The composition of claim 99, wherein one or more of the amino acids comprises serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, histidine.

104. (Previously presented) The composition of claim 99, wherein one or more of the amino acids comprises framework and recognition element.

105. (Previously presented) The composition of claim 99, wherein one or more of the amino acids comprises derivatized amino acid.

106. (Previously presented) The composition of claim 104, wherein one or more of the derivatized amino acids has the formula:

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$$RE_2$$
$$|$$
$$Y$$
$$|$$
$$C=O$$
$$|$$

$$RE_1 — X — \underset{H}{N} — \underset{\underset{R_2}{|}}{\overset{\overset{}{|}}{C}} — R_3 — Z — L$$

in which:

X is absent or C=O;

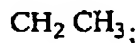Y is absent, NH, or O; Z is O;

R_2 is H or CH_3;

R_3 is CH_2 or CH_2-phenyl;

RE_1 is B1, B2, B3, B4, B5, B6, B7, B8, B9, A1, A2, A3, A4, A5, A6, A7, A8, or A9;

RE_2 is A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4, B5, B6, B7, B8, or B9;
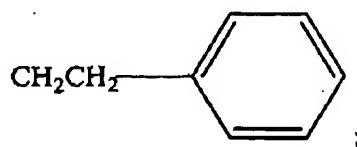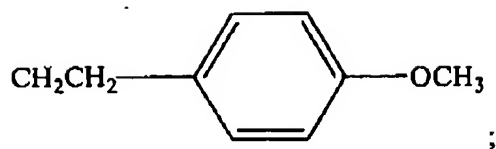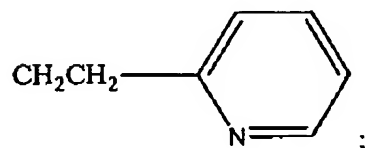
L is $(CH_2)_nCOOH$, with n=1-16;

   A1 is

      $CH_2 CH_3$;

   A2 is

      $CH_2CH(CH_3)_2$;

   A3 is

      CH_2CH_2—⟨phenyl ring⟩ ;

A4 is

;

A5 is

;

A6 is

$CH_2CH_2\text{-}O\text{-}CH_3$;

A7 is

$CH_2CH_2\text{-}OH$;

A8 is

$CH_2CH_2\text{-}NH\text{-}C(O)CH_3$;

A9 is

;

B1 is

CH_3;

B2 is

;

B3 is

;

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B4 is

$CH=CH$— (phenyl ring) ;

B5 is

CH_2CH_2— (pyridine ring with N) ;

B6 is

$CH_2\text{-}S\text{-}CH_3$;

B7 is

$CH_2CH(OH)CH_3$;

B8 is

$CH_2CH_2C(O)\text{-}NH_2$; and

B9 is

$CH_2CH_2CH_2\text{-}N\text{-}(CH_3)_2$.
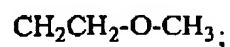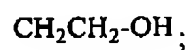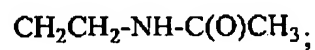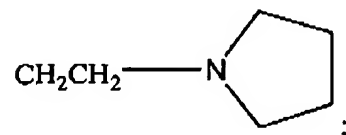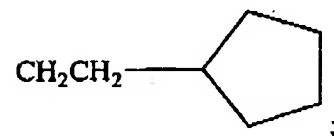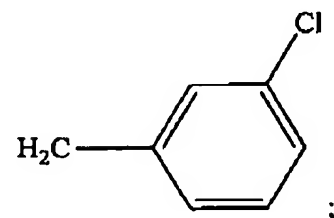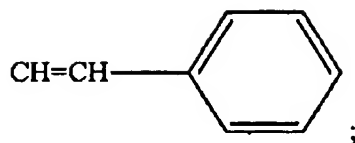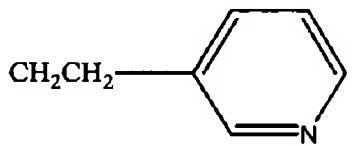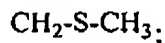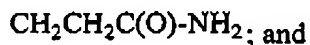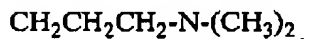
107.   (Previously presented) The composition of claim 99, wherein one or more of the building blocks consists of one or more amino acids

108.   (Previously presented) The composition of claim 99, wherein one or more of the building blocks has the formula:

linker-framework-(recognition element).

109.   (Currently Amended) The composition of claim 108, wherein the framework is a naturally occurring amino acid or synthetic amino acid.

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110.   (Currently Amended) The composition of claim 109, wherein the framework is a naturally occurring amino acid, and the naturally occurring amino acid is serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, histidine.

111.   (Previously presented) The composition of claim 108, wherein the recognition element comprises amino acid side chain functional group.

112.   (Previously presented) The composition of claim 111, wherein the functional group comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

113.   (Previously presented) The composition of claim 108, wherein the recognition element comprises amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group.

114.   (Currently Amended) The composition of claim 99, comprising a plurality of spots on the support;

        the spots comprising a plurality of 2, 3, 4, 5 or 6 different building blocks; and

        the different building blocks being independently coupled to the support.

115.   (Previously presented) The composition of claim 114, wherein the spots are configured in an array.

116.   (Previously presented) The composition of claim 99, comprising a functionalized lawn coupled to the support and the building blocks coupled in spots to the lawn.

117.   (Currently Amended) An artificial receptor, the artificial receptor comprising a plurality of 2, 3, 4, 5, or 6 different building blocks independently coupled to a support;

        one or more of the building blocks comprising one or more amino acids.

118.   (Currently Amended) A heterogeneous building block array comprising:

        a support; and

        a plurality of spots on the support;

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the spots comprising ~~a plurality of~~ <u>2, 3, 4, 5, or 6 different</u> building blocks; and

the <u>different</u> building blocks being <u>independently</u> coupled to the support;

wherein one or more of the building blocks comprises one or more amino acids.

119.　(Currently Amended) A composition comprising:

a surface; and

a region on the surface comprising a plurality of <u>spots, each spot comprising 2, 3, 4, 5, or 6 different</u> building blocks;

the <u>different</u> building blocks being <u>independently</u> coupled to the support;

one or more of the building blocks comprising one or more amino acids.

120.　(Previously presented)　A composition of matter comprising a plurality of building blocks;

one or more of the building blocks having the formula:

linker-framework-(first recognition element)(second recognition element); and

one or more of the building blocks comprising one or more amino acids.

121.　(Previously presented) The composition of matter of claim 120, wherein one or more of the amino acids comprises naturally occurring amino acid or synthetic amino acid.

122.　(Previously presented) The composition of matter of claim 120, wherein one or more of the amino acids comprises serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, histidine.

123.　(Previously presented) The composition of matter of claim 120, wherein one or more of the amino acids comprises framework and recognition element.

124.　(Previously presented) The composition of matter of claim 120, wherein one or more of the amino acids comprises derivatized amino acid.

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125.   (Previously presented) The composition of matter of claim 124, wherein one or more of the derivatized amino acids has the formula:

$$RE_1 - X - \underset{H}{N} - \underset{\underset{R_2}{|}}{\overset{\overset{RE_2}{|}}{\underset{\underset{}{|}}{\overset{\overset{Y}{|}}{\underset{\underset{}{|}}{\overset{C=O}{|}}}}}\!\!\!\! C - R_3 - Z - L$$

in which:

X is absent or C=O;

Y is absent, NH, or O; Z is O;

R_2 is H or CH_3;

R_3 is CH_2 or CH_2-phenyl;

RE_1 is B1, B2, B3, B4, B5, B6, B7, B8, B9, A1, A2, A3, A4, A5, A6, A7, A8, or A9;

RE_2 is A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4, B5, B6, B7, B8, or B9;

L is $(CH_2)_nCOOH$, with n=1-16;

A1 is

$CH_2 CH_3$;

A2 is

$CH_2CH(CH_3)_2$;

A3 is

CH_2CH_2—⟨phenyl⟩;

A4 is

;

A5 is

;

A6 is

$CH_2CH_2-O-CH_3$;

A7 is

CH_2CH_2-OH;

A8 is

$CH_2CH_2-NH-C(O)CH_3$;

A9 is

;

B1 is

CH_3;

B2 is

;

B3 is

;

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B4 is

$CH=CH-$;

B5 is

CH_2CH_2- ;

B6 is

$CH_2\text{-}S\text{-}CH_3$;

B7 is

$CH_2CH(OH)CH_3$;

B8 is

$CH_2CH_2C(O)\text{-}NH_2$; and

B9 is

$CH_2CH_2CH_2\text{-}N\text{-}(CH_3)_2$.
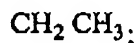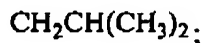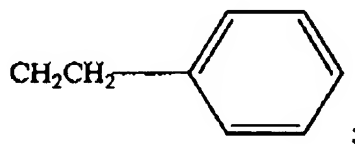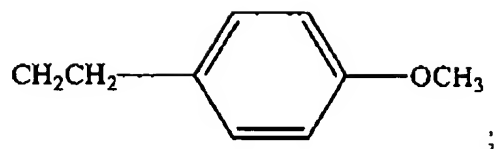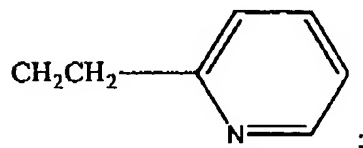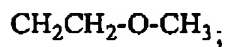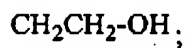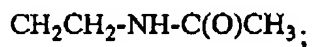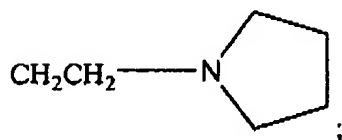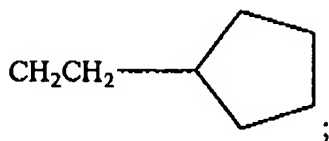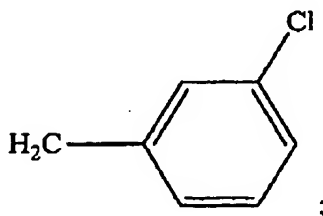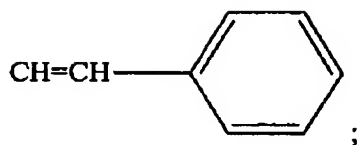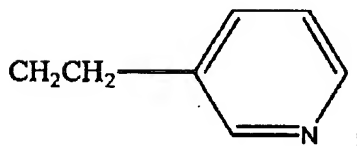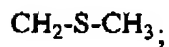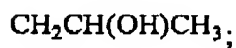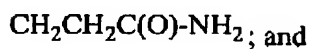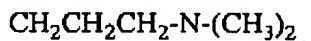
126. (Previously presented) The composition of matter of claim 120, wherein one or more of the building blocks has the formula:

linker-framework-(recognition element).

127. (Currently Amended) The composition of matter of claim 126, wherein the framework is a naturally occurring amino acid or synthetic amino acid.

128. (Previously presented) The composition of matter of claim 126, wherein the recognition element comprises amino acid side chain functional group.

129. (Previously presented) The composition of matter of claim 120, comprising about 10 to about 200 distinct building blocks.

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130.   (Previously presented) The composition of matter of claim 120, wherein the building blocks are coupled to a support.